8 Testing Equipment

Laboratory

General
Sampling
Sample Reduction
Sieve Analysis
Decantation
Deleterious and Chert

Test Equipment Verification

Laboratory Set-Up

CHAPTER EIGHT:
TESTING EQUIPMENT

Before entering the Coordinated Testing Phase of the Certified Aggregate Producer Program the producer must have a suitable laboratory and testing equipment that has been verified to accomplish the program requirements. Laboratories will be checked by an INDOT representative before start-up of the Coordinated Testing Phase. They will also be checked periodically to maintain the integrity of certified production.

LABORATORY

GENERAL

Equipment required for various general procedures:

1) Electronic balance, Class G2, general purpose balance in accordance with **AASHTO M 231**. The balance shall be readable to 0.1 g and accurate to 0.2 g or 0.1 percent of the test load, whichever is greater, throughout the range of use.

2) Laboratory oven, (optional) capable of maintaining a temperature of 230 ± 9 °F, and ample interior volume to handle the anticipated sample load.

3) Metal pans for drying and storage.

4) Utensils for washing and drying samples, for example trowels, spatulas, etc.

5) Appropriate data sheets, log books, etc.

SAMPLING

Equipment required for **AASHTO T 2** or **ITM 207**:

1) Square-nose shovel.

2) Sampling tube for sand.

3) Containers, such as 20 gallon buckets, plastic fiber bag, etc. Galvanized bushel tubs work well and will stand up to oven temperatures.

4) Labels of sufficient size to allow for proper identification of samples.

SAMPLE REDUCTION

Equipment required for **AASHTO T 248**:

1) Mechanical splitters.

2) Buckets**.**

SIEVE ANALYSIS

Equipment required for **AASHTO T 27**:

1) Sieves for coarse aggregates 15 in x 23 in. or 14 in. x 14 in. are recommended with sieve designations 2 in., 1 ½ in., 1 in., 3/4 in., 1/2 in., 3/8 in., No. 4, and pan. For fine aggregates 8 in. round sieves are standard with sieve designations 3/8 in., No. 4, No. 8, No. 16, No. 30, No. 50, No. 100, No. 200, and pan.

2) Mechanical sieve shaker, appropriate model to accommodate sieves.

3) Sieve brushes, wire and bristle brushes (note:never use a wire brush on sieves with openings smaller than the openings on a No. 50 sieve)

DECANTATION

Equipment required for **AASHTO T 11**:

1) Sieves, No. 16 and No. 200. Protect the No. 200 sieve from punctures and tears by covering with a No. 16 sieve.

2) Container, size sufficient to contain the sample covered with water and permit vigorous agitation.

3) Wetting agent, such as liquid detergent, etc. Some fine materials, especially limestone dust, require a wetting agent to break the surface tension of the particles. A drop or two of dishwashing liquid is usually sufficient.

4) Decant machine (may be used provided the results are consistent with those obtained using manual operations.)

DELETERIOUS AND CHERT

1) Scratch hardness tester.

2) Hydrochloric acid and glass plate.

TEST EQUIPMENT VERIFICATION

The test equipment shall be properly verified, and maintained within the limits described in the applicable test method. Verification of the test equipment is required prior to beginning testing in the Coordinated Testing Phase. The producer shall also verify the equipment at the minimum frequency as follows:

EQUIPMENT	REQUIREMENT	MINIMUM FREQUENCY	PROCEDURES
Balances	Verification	12 mo.	ITM 910
Mechanical shakers	Check sieving thoroughness	12 mo.	ITM 906
Ovens	Verify temperature settings	6 mo.	ITM 903
Sieves	Check physical thoroughness	6 mo.	ITM 902

LABORATORY SET-UP

Proper organization of the laboratory is necessary in order to maximize efficiency and minimize problems and erroneous results. Give special consideration to the flow of the work to be done and try to organize the laboratory in the direction of this flow. For example, one might arrange the equipment from left to right when running sieve analyses as follows:

1) Riffle splitter -- for reduction of incoming samples.

2) Oven -- for drying samples after reduction.

3) Cooling rack and fan -- for cooling samples when dry (note: make sure that the fan does not blow towards the balance in the weighing area and does not disperse sample fines).

4) Coarse aggregate shaker.

5) Fine aggregate shaker.

6) Weighing area -- balance should be in an area free from vibration, dust, and air flow.

Every laboratory situation is different. Try to set up your lab to meet the flow requirements of the most routine tests you perform. Minimize the need for back-tracking, especially if more than one technician is working at a time. A little extra time and thought to the set up of your lab will significantly increase productivity and decrease turn-around time.